Department of Pesticide Regulation

Mary-Ann Warmerdam
Director

Arnold Schwarzenegger
Governor

M E M O R A N D U M

TO: Christopher Reardon
Chief Deputy Director

FROM: Mary-Ann Warmerdam
Director
916-445-4000

DATE: April 15, 2010

SUBJECT: DIRECTOR'S PROPOSED DECISION CONCERNING CHLOROPICRIN AS A TOXIC AIR CONTAMINANT

Attached is a public notice of the proposed decision concerning my response to the Scientific Review Panel's findings on chloropicrin as a toxic air contaminant. My response has been made in accordance with all authorities and requirements stipulated in the Food and Agricultural Code and California Code of Regulations that mandate this determination. The Scientific Review Panel's findings were received on April 5, 2010. Therefore, my response has been made within the ten-day statutory deadline.

I thank you, the staff, and all the members of the Scientific Review Panel for the excellent work.

Attachment

cc: Joan E. Denton, OEHHA Director (w/Attachment)
James Goldstene, ARB Executive Officer (w/Attachment)
Scientific Review Panel (w/Attachment)
James Behrmann, ARB Liaison to the Scientific Review Panel (w/Attachment)
Charles M. Andrews, DPR Associate Director (w/Attachment)
Marylou Verder-Carlos, DPR Assistant Director (w/Attachment)
DPR Program Branch Chiefs (w/Attachment)

Department of Pesticide Regulation

Mary-Ann Warmerdam
Director

Arnold Schwarzenegger
Governor

April 15, 2010

Post Until May 17, 2010

NOTICE OF PROPOSED DECISION CONCERNING THE DIRECTOR'S DECLARATION OF CHLOROPICRIN AS A TOXIC AIR CONTAMINANT

Food and Agricultural Code (FAC) section 14023 requires the Director of the Department of Pesticide Regulation (DPR) to determine if a pesticide is a toxic air contaminant (TAC) after receiving the findings of the Scientific Review Panel (SRP), a panel of experts representing a range of scientific disciplines. Based on the findings of the SRP's assessment of the report entitled "Evaluation of Chloropicrin as a Toxic Air Contaminant," and the criteria given in Title 3, California Code of Regulations (3 CCR) section 6890(b), the Director proposes to declare chloropicrin as a TAC.

Background

With the enactment of California's TAC Act (Assembly Bill 1807, Tanner, Chapter 1047, Statutes of 1983; amended by Tanner, Chapter 1380, Statutes of 1984), the Legislature created the statutory framework for the evaluation and control of chemicals as TACs. The statute defines TACs as air pollutants that may cause or contribute to increases in serious illness or death, or that may pose a present or potential hazard to human health. DPR is responsible for the evaluation of pesticides as TACs.

In general, the law focuses on the evaluation and control of pesticides in ambient community air. In implementing the law, DPR must: (1) conduct a review of the physical properties, environmental fate, and human health effects of the candidate pesticide; (2) determine the levels of human exposure in the environment; and (3) estimate the potential human health risk from those exposures. The law requires DPR to list in regulation those pesticides that meet the criteria to be TACs.

For each pesticide, the law requires the preparation of a report that includes the environmental fate and use of the pesticide, an assessment of exposure of the public to air concentrations of the pesticide, and a health assessment. The report is reviewed by the Office of Environmental Health Hazard Assessment and the Air Resources Board, and is made available for public review. Based on the results of these reviews, the draft report is revised as appropriate. The draft undergoes a rigorous peer review for scientific soundness by the SRP. Based on the results of this comprehensive evaluation, the DPR Director determines whether the candidate is a TAC. If the Director determines the pesticide meets the criteria to be a TAC, DPR declares the pesticide a TAC in regulation, and adds it to the TAC list.

Once a candidate pesticide has been declared a TAC, it enters phase two of the program--the mitigation, or control, phase. In the mitigation phase, DPR investigates the need for, and appropriate degree of, control for the TAC. If reductions in exposure are needed, DPR must develop control measures to reduce emissions to levels that adequately protect public health.

Department Conclusions

Title 3, CCR section 6890 states, "A pesticide shall be identified as a toxic air contaminant if its concentrations in ambient air are greater than the following levels (for the purposes of this section, a threshold is defined as the dose of a chemical below which no adverse effect occurs):

(a) For pesticides which have thresholds for adverse health effects, this level shall be ten-fold below the air concentration which has been determined by the Director to be adequately protective of human health.

(b) For pesticides which do not have thresholds for adverse health effects, this level shall be equivalent to the air concentration which would result in a ten-fold lower risk than that which has been determined by the Director to be a negligible risk."

The reference concentration (RfC) is the estimate of daily human exposure that is not likely to result in health concerns. It is calculated from the No-Observed-Effect Levels (NOELs) from toxicity studies in humans or experimental animals and applicable uncertainty factors. The NOELs from the animal studies were converted to human equivalent concentrations by adjusting for species differences in breathing rates. The human equivalent concentrations for children, who had the highest breathing rate among human subpopulations, were 44, 270, 92, 35, and 27 parts per billion (ppb) for 1-hour, 8-hour, 24-hour, subchronic, and chronic exposures, respectively. The RfCs for chloropicrin that were calculated included using an uncertainty factor of 100 when the NOELs were based on animal studies assuming humans are 10 times more sensitive than animals, and that there is a 10-fold variation in the sensitivity of the human population. For the 1-hour RfC where a human NOEL was used, an uncertainty factor of 10 for intraspecies variation was used. The RfCs for children are 4.4, 2.7, 0.92, 0.35, and 0.27 ppb for 1-hour, 8-hour, 24-hour, subchronic, and chronic exposures, respectively. The weight of evidence for chloropicrin was considered sufficient to estimate a cancer potency factor which was 2.2 milligrams per kilogram per day^{-1} (mg/kg/day)$^{-1}$. The RfC corresponding to a negligible risk level for cancer was 0.24 parts per trillion. As described above, air concentrations exceeding one-tenth (10 percent) of the reference concentrations meet the criteria for listing chloropicrin as a TAC. Therefore, chloropicrin air concentrations exceeding 0.44, 0.27, 0.092, 0.035, 0.027, and 0.000024 ppb for 1-hour, 8-hour, 24-hour, subchronic, chronic, and lifetime exposures, respectively, would meet the criteria for listing it as a TAC.

Human bystander exposure to chloropicrin following soil fumigation was estimated using on-site flux data from application-site monitoring conducted by registrants in Arizona (1996) and California (2004), since the off-site monitoring may not have represented the worse-case exposure relative to weather and sampler location. Air modeling generated downwind centerline estimates at 1.2 meters above ground, 3 meters from the edge of a 40-acre square field treated at the maximum application rate, and were considered worse-case estimates. From the air modeling, 1-hour, 8-hour, and 24-hour exposure estimates were generated for the different application methods. The broadcast nontarped application method had the highest 1-hour and 8-hour estimates at 16,000 ppb and 6,500 ppb, respectively. The bedded tarped application method had the highest 24-hour exposure estimate at 1,100 ppb. The seasonal exposure was estimated from the 24-hour average flux over 2 weeks, adjusting for time using the peak-to-mean ratio. The highest seasonal exposure was 73 ppb for the bedded tarped application method. Annual exposure was estimated assuming a five-month use season. The highest annual exposure was 30 ppb for the bedded tarped application method. Lifetime exposure was assumed to be the same as annual exposure for residential bystanders, but for occupational bystanders it was assumed exposure was limited to 40 years of a 70-year lifespan. These exposures represented 370,000, 240,000, 120,000, 21,000, and 11,000 percent of the RfCs for 1-hour, 8-hour-, 24-hour, seasonal, and annual exposure, respectively. Exposures of bystanders to structural fumigation were based on air monitoring data from the fumigation of four different houses in California where chloropicrin was used as a warning agent with sulfuryl fluoride. The highest 1-hour, 8-hour, and 24-hour off-site air concentrations with structural fumigation were 36, 10, and 7.4 ppb, respectively. These off-site air concentrations represent 820, 370, and 800 percent of the respective RfC. The highest indoor air concentrations found with structural fumigation of these houses were 456, 183, and 172 ppb for 1-hour, 8-hour, and 24-hour monitoring periods, respectively. These indoor air concentrations represented 10,000, 6,700, and 19,000 of the respective RfC. No seasonal or annual exposure is anticipated with structural fumigation. The structural fumigation studies were also used to generate bystander exposure estimates associated with fumigation of empty storage bins. Adjusting for the maximum application rate and building size, the 1-hour, 8-hour, and 24-hour bystander exposures for enclosed space fumigation were 24,000, 6,800, and 5,000 ppb, respectively. Assuming 2 days of exposure per year, the annual exposure for this use was 28 ppb. These were 550,000, 250,000, 540,000, and 10,000 percent of the 1-hour, 8-hour, 24-hour and annual RfC, respectively. All the exposure estimates for chloropicrin represented more than ten percent of the RfC, often by several orders of magnitude, clearly meeting the criteria for identifying chloropicrin as a TAC.

The SRP agrees with the science presented in the risk characterization document and recommends that the Director identify chloropicrin as a TAC.

Department Actions

DPR proposes to adopt a regulation designating chloropicrin as a TAC. DPR proposes to add chloropicrin to the list of pesticides in 3 CCR section 6860(a).

DPR will conduct a public hearing concerning the proposed regulation.

APPROVED BY: _____ Date: 04/15/10
Mary-Ann Warmerdam, Director